FIG. 1

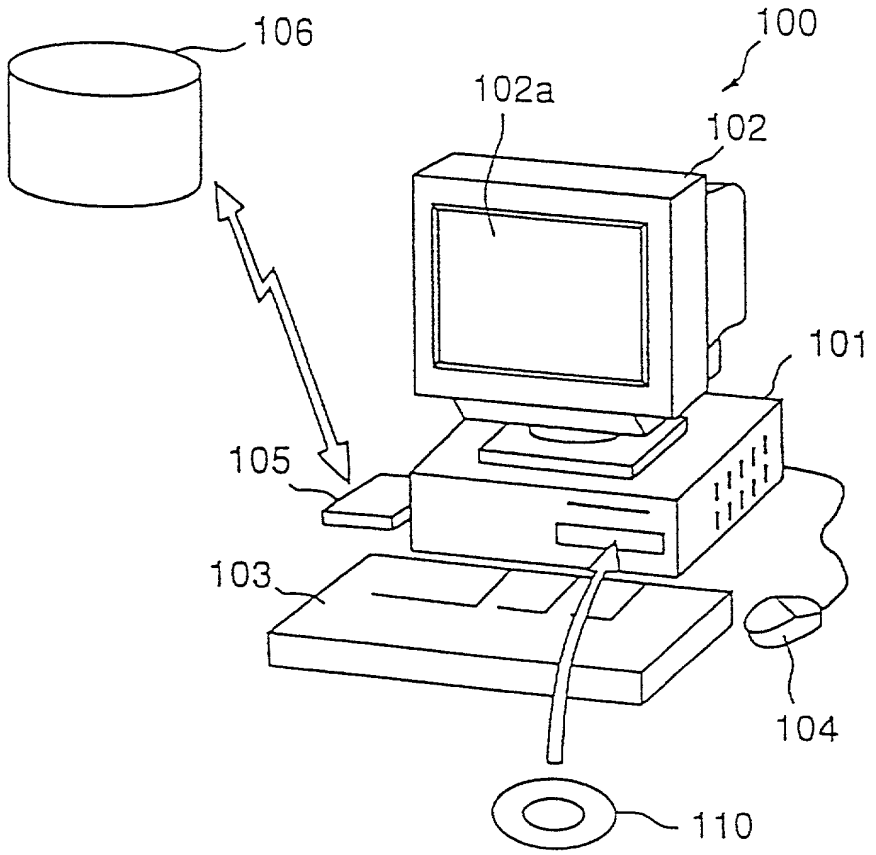

FIG. 2

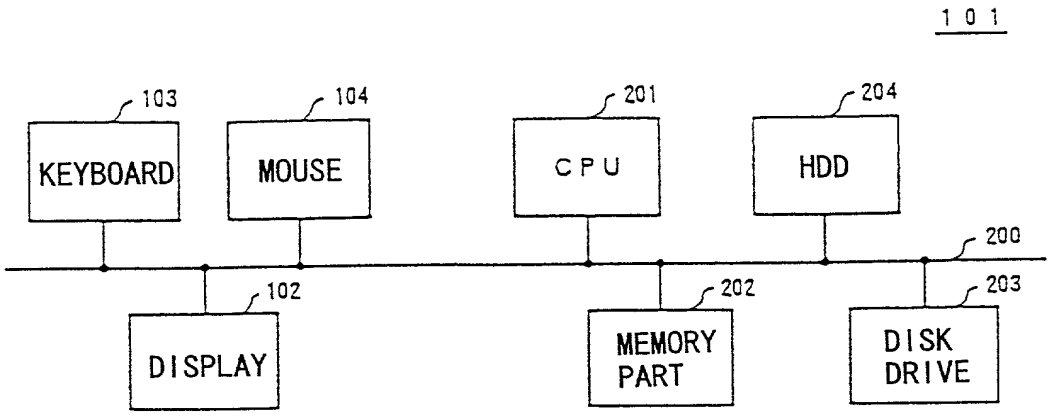
101
103
KEYBOARD
104
MOUSE
201
CPU
204
HDD
200
102
DISPLAY
202
MEMORY PART
203
DISK DRIVE

FIG.3

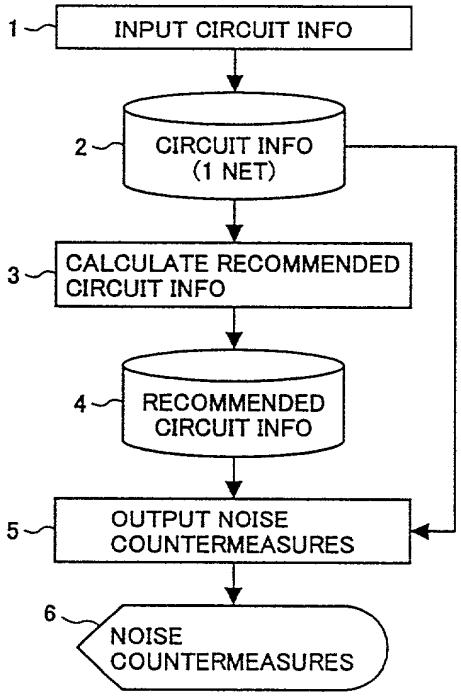
1
INPUT CIRCUIT INFO
2
CIRCUIT INFO
(1 NET)
3
CALCULATE RECOMMENDED
CIRCUIT INFO
4
RECOMMENDED
CIRCUIT INFO
5
OUTPUT NOISE
COUNTERMEASURES
6
NOISE
COUNTERMEASURES

FIG.4

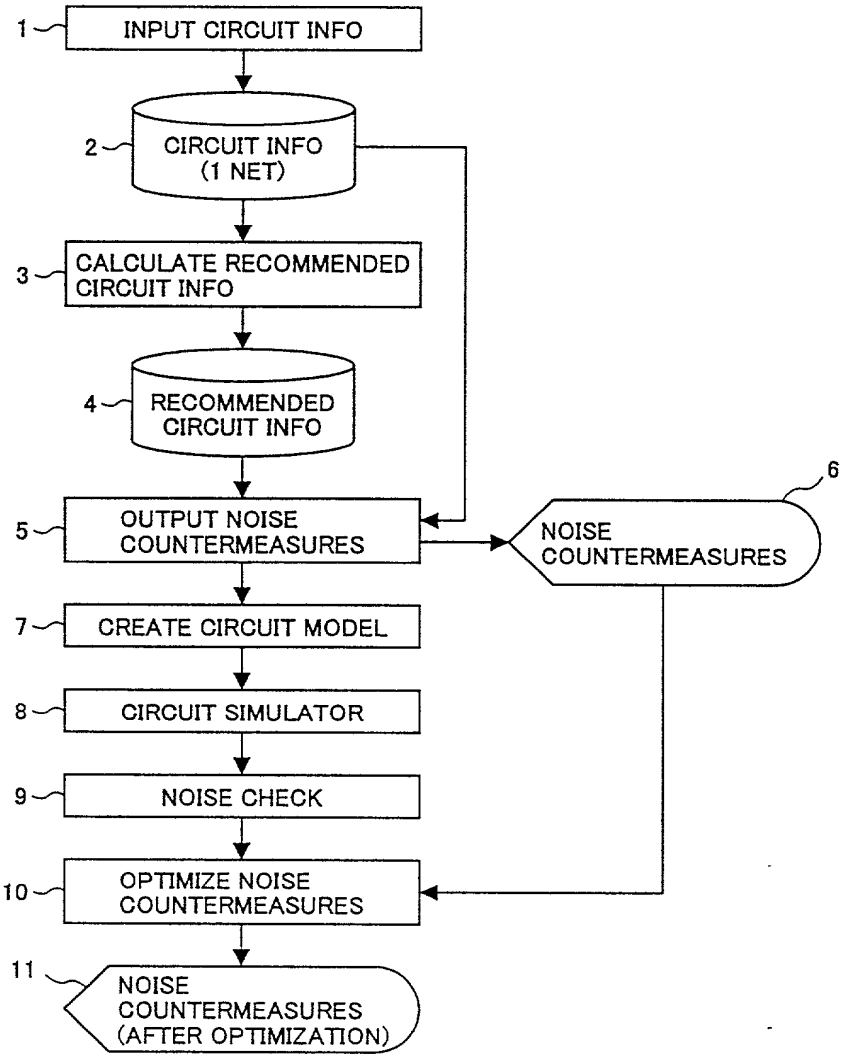
1
INPUT CIRCUIT INFO
2
CIRCUIT INFO
(1 NET)
3
CALCULATE RECOMMENDED
CIRCUIT INFO
4
RECOMMENDED
CIRCUIT INFO
5
OUTPUT NOISE
COUNTERMEASURES
6
NOISE
COUNTERMEASURES
7
CREATE CIRCUIT MODEL
8
CIRCUIT SIMULATOR
9
NOISE CHECK
10
OPTIMIZE NOISE
COUNTERMEASURES
11
NOISE
COUNTERMEASURES
(AFTER OPTIMIZATION)

FIG. 5

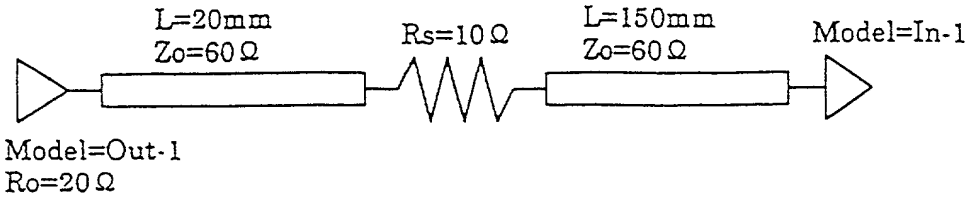

FIG. 6

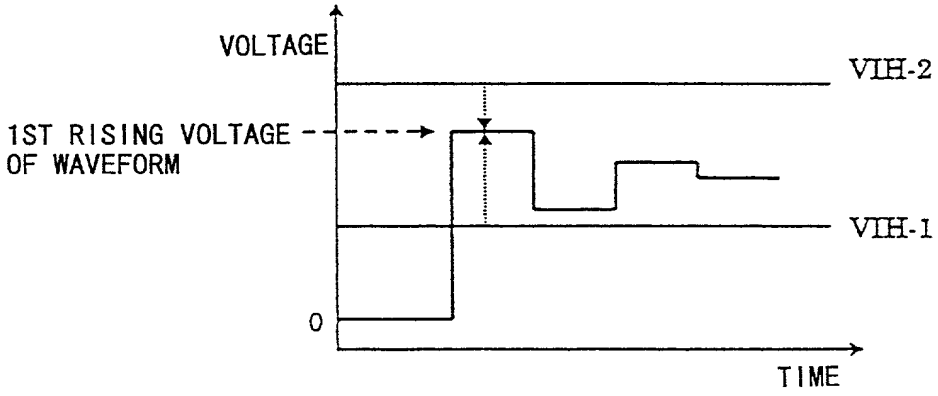

FIG. 7

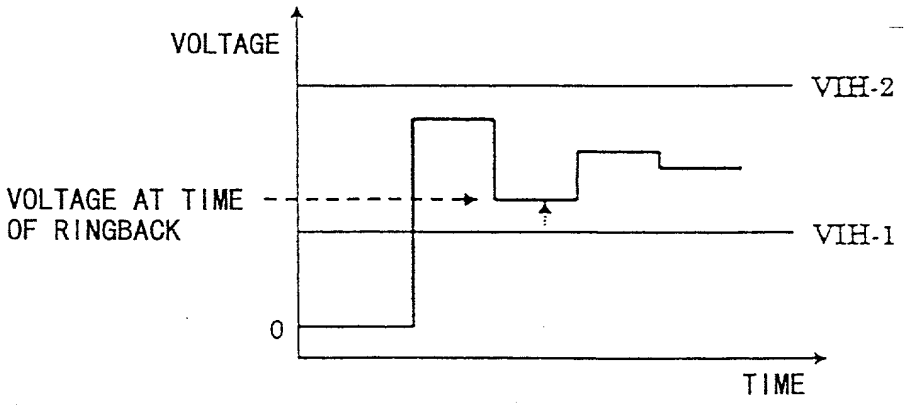

FIG.8

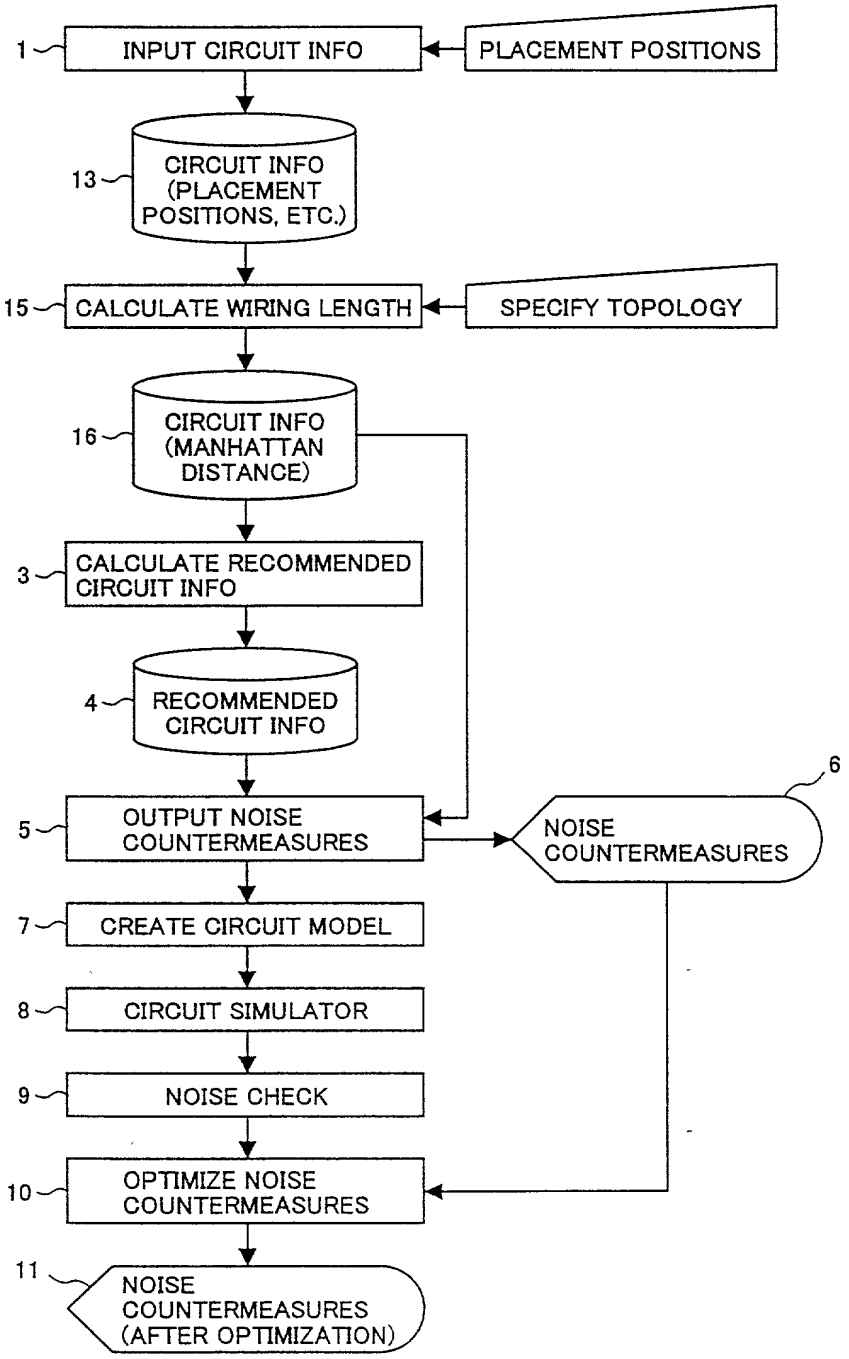
1
INPUT CIRCUIT INFO
PLACEMENT POSITIONS
13
CIRCUIT INFO (PLACEMENT POSITIONS, ETC.)
15
CALCULATE WIRING LENGTH
SPECIFY TOPOLOGY
16
CIRCUIT INFO (MANHATTAN DISTANCE)
3
CALCULATE RECOMMENDED CIRCUIT INFO
4
RECOMMENDED CIRCUIT INFO
6
5
OUTPUT NOISE COUNTERMEASURES
NOISE COUNTERMEASURES
7
CREATE CIRCUIT MODEL
8
CIRCUIT SIMULATOR
9
NOISE CHECK
10
OPTIMIZE NOISE COUNTERMEASURES
11
NOISE COUNTERMEASURES (AFTER OPTIMIZATION)

FIG. 9

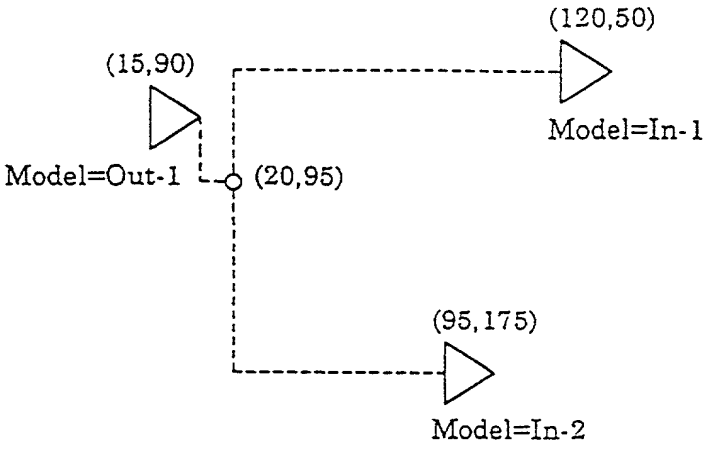

FIG.10

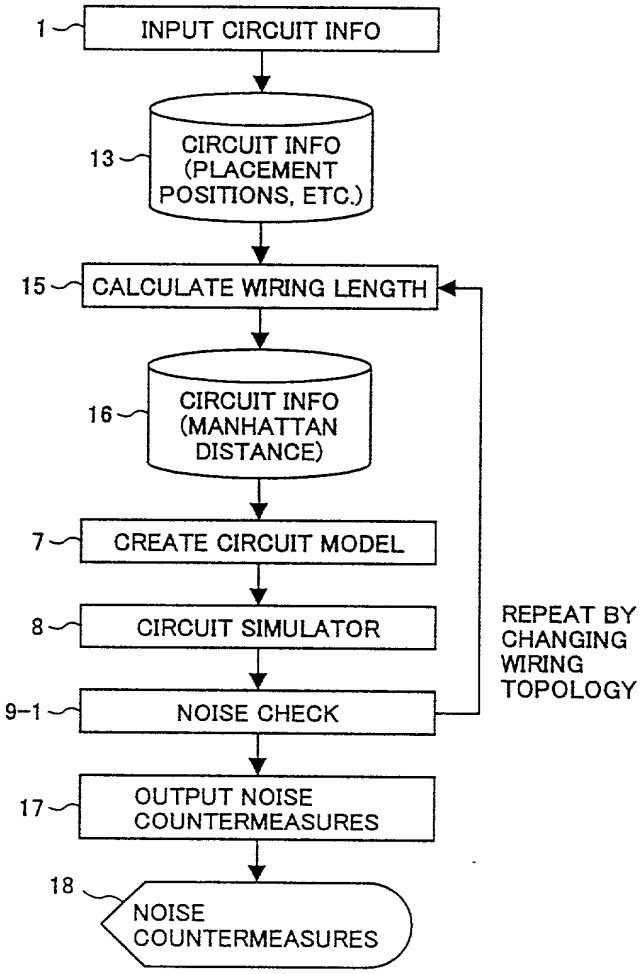
1
INPUT CIRCUIT INFO
13
CIRCUIT INFO (PLACEMENT POSITIONS, ETC.)
15
CALCULATE WIRING LENGTH
16
CIRCUIT INFO (MANHATTAN DISTANCE)
7
CREATE CIRCUIT MODEL
8
CIRCUIT SIMULATOR
9-1
NOISE CHECK
17
OUTPUT NOISE COUNTERMEASURES
18
NOISE COUNTERMEASURES
REPEAT BY CHANGING WIRING TOPOLOGY

FIG.11

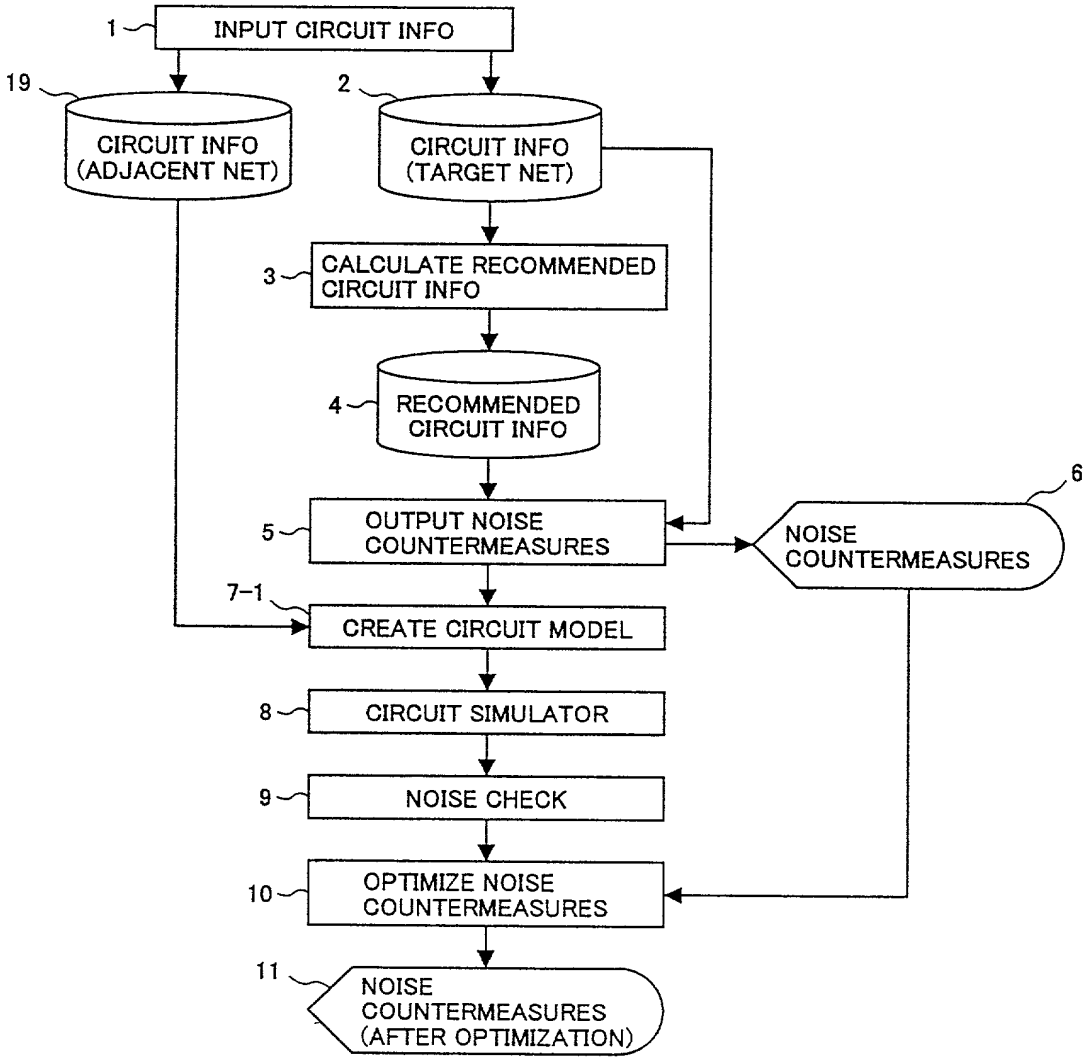
1
INPUT CIRCUIT INFO
19
CIRCUIT INFO (ADJACENT NET)
2
CIRCUIT INFO (TARGET NET)
3
CALCULATE RECOMMENDED CIRCUIT INFO
4
RECOMMENDED CIRCUIT INFO
5
OUTPUT NOISE COUNTERMEASURES
6
NOISE COUNTERMEASURES
7-1
CREATE CIRCUIT MODEL
8
CIRCUIT SIMULATOR
9
NOISE CHECK
10
OPTIMIZE NOISE COUNTERMEASURES
11
NOISE COUNTERMEASURES (AFTER OPTIMIZATION)

FIG. 12

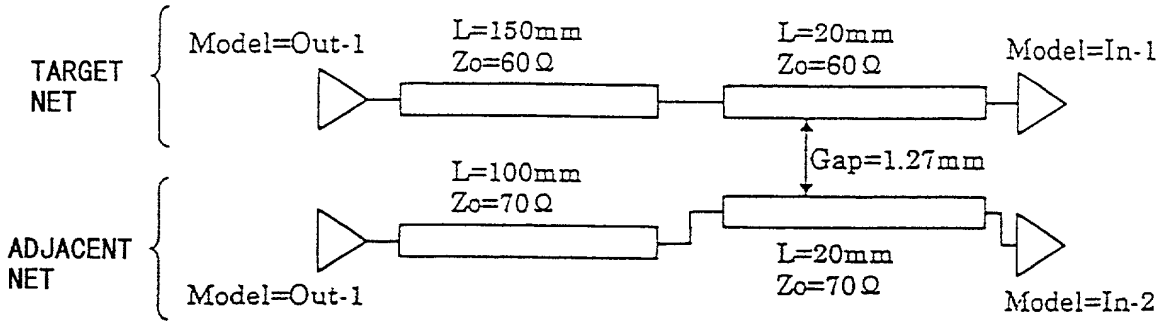
TARGET NET
Model=Out-1
L=150mm
Zo=60Ω
L=20mm
Zo=60Ω
Model=In-1
Gap=1.27mm
ADJACENT NET
L=100mm
Zo=70Ω
L=20mm
Zo=70Ω
Model=Out-1
Model=In-2

FIG.13

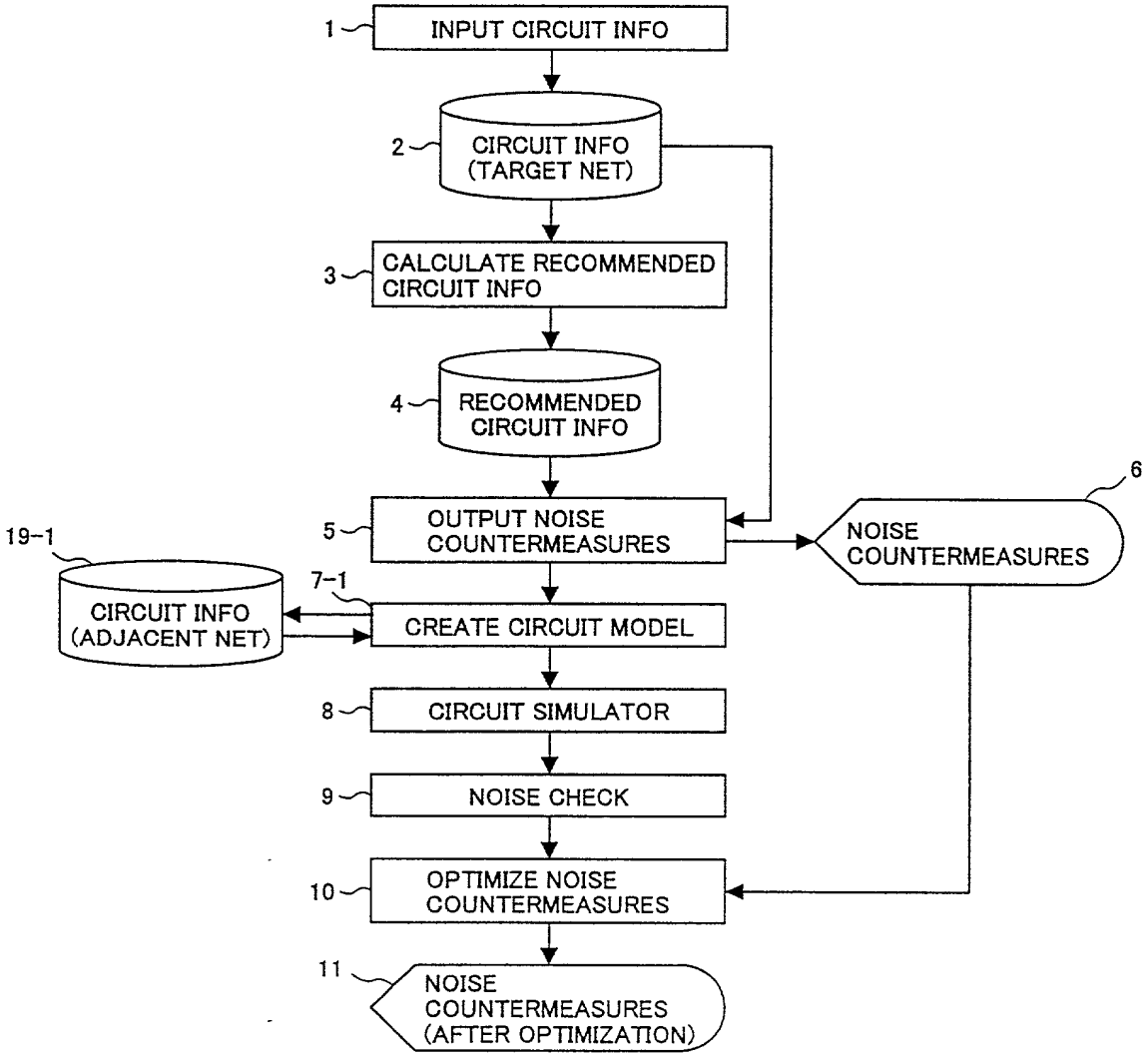
1
INPUT CIRCUIT INFO
2
CIRCUIT INFO (TARGET NET)
3
CALCULATE RECOMMENDED CIRCUIT INFO
4
RECOMMENDED CIRCUIT INFO
5
OUTPUT NOISE COUNTERMEASURES
6
NOISE COUNTERMEASURES
19-1
CIRCUIT INFO (ADJACENT NET)
7-1
CREATE CIRCUIT MODEL
8
CIRCUIT SIMULATOR
9
NOISE CHECK
10
OPTIMIZE NOISE COUNTERMEASURES
11
NOISE COUNTERMEASURES (AFTER OPTIMIZATION)

FIG. 14

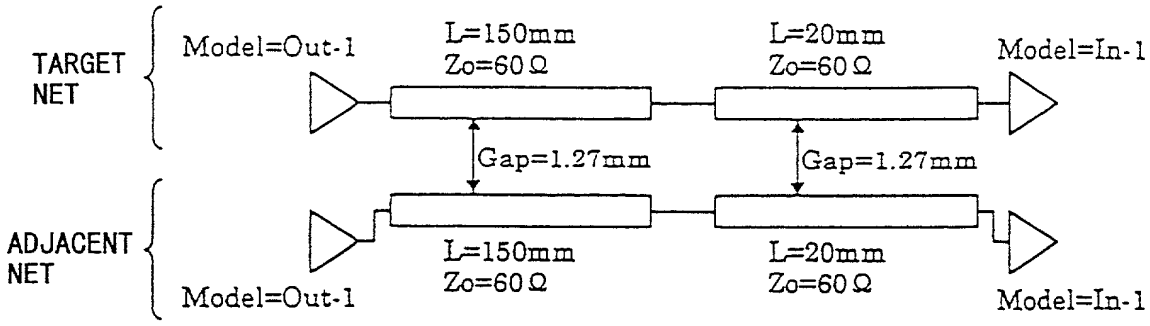
TARGET NET
Model=Out-1
L=150mm
Zo=60Ω
L=20mm
Zo=60Ω
Model=In-1
Gap=1.27mm
Gap=1.27mm
ADJACENT NET
L=150mm
Zo=60Ω
L=20mm
Zo=60Ω
Model=Out-1
Model=In-1

FIG.15

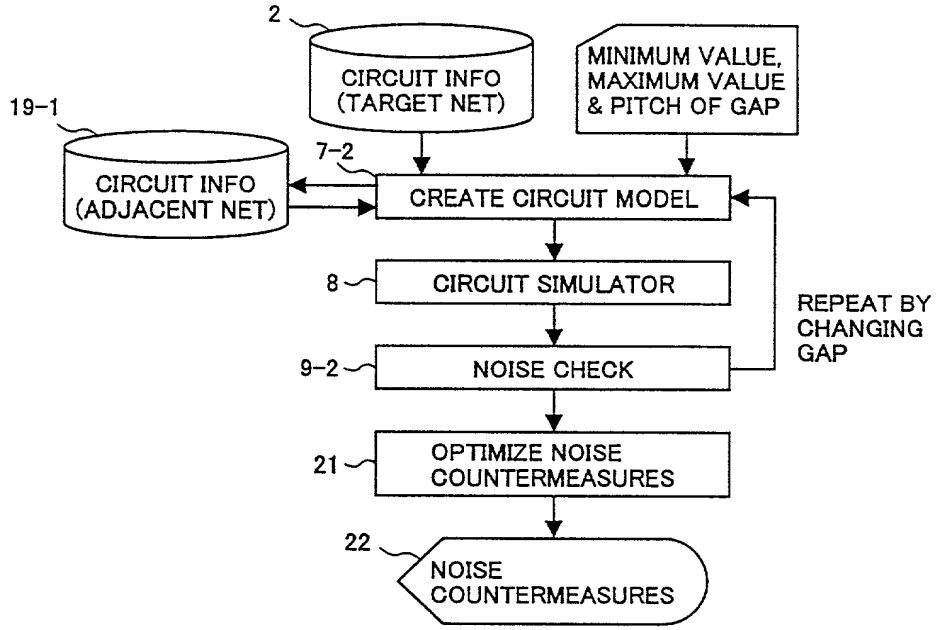
2
CIRCUIT INFO
(TARGET NET)
MINIMUM VALUE,
MAXIMUM VALUE
& PITCH OF GAP
19-1
CIRCUIT INFO
(ADJACENT NET)
7-2
CREATE CIRCUIT MODEL
8
CIRCUIT SIMULATOR
9-2
NOISE CHECK
REPEAT BY
CHANGING
GAP
21
OPTIMIZE NOISE
COUNTERMEASURES
22
NOISE
COUNTERMEASURES

FIG. 16

WIRING TOPOLOGY: LOAD CONCENTRATION TYPE
CHARACTERISTIC IMPEDANCE OF WIRING PATTERN: Z_0=60Ω
TRANSMISSION DELAY TIME OF WIRING PATTERN : T_d=7.0ns/m

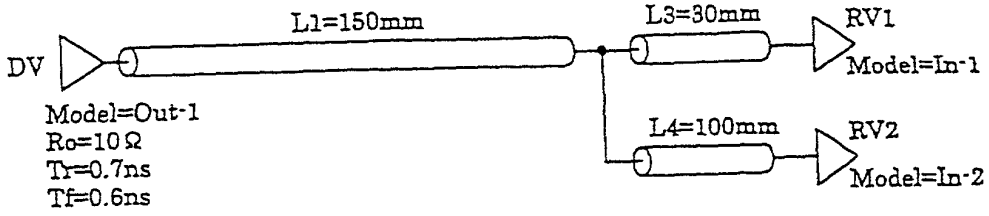

FIG. 17

WIRING TOPOLOGY: LOAD CONCENTRATION TYPE
CHARACTERISTIC IMPEDANCE OF WIRING PATTERN: Z_0=60Ω
TRANSMISSION DELAY TIME OF WIRING PATTERN : T_d=7.0ns/m

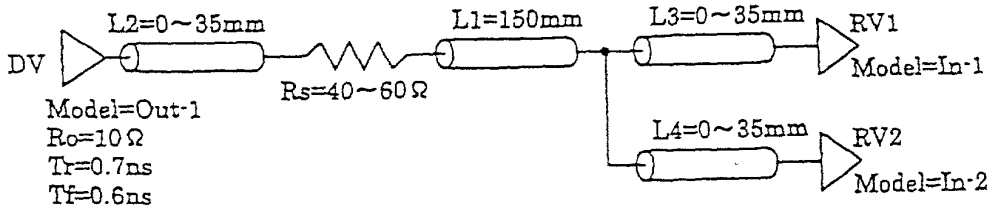

FIG. 18

WIRING TOPOLOGY: STAR TYPE
CHARACTERISTIC IMPEDANCE OF WIRING PATTERN: Z_0=60Ω
TRANSMISSION DELAY TIME OF WIRING PATTERN : T_d=7.0ns/m

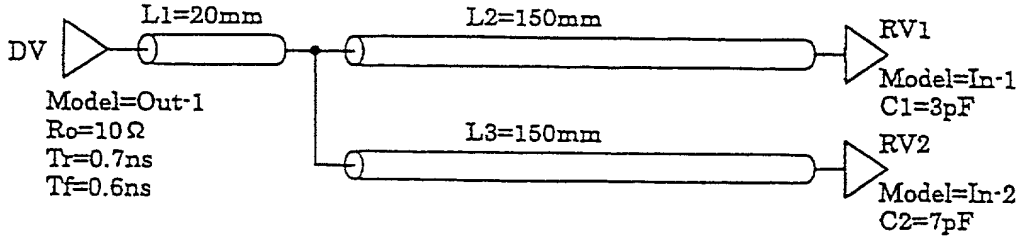

FIG. 19

WIRING TOPOLOGY: LOAD CONCENTRATION TYPE
CHARACTERISTIC IMPEDANCE OF WIRING PATTERN: Z_0=60Ω
TRANSMISSION DELAY TIME OF WIRING PATTERN : T_d=7.0ns/m

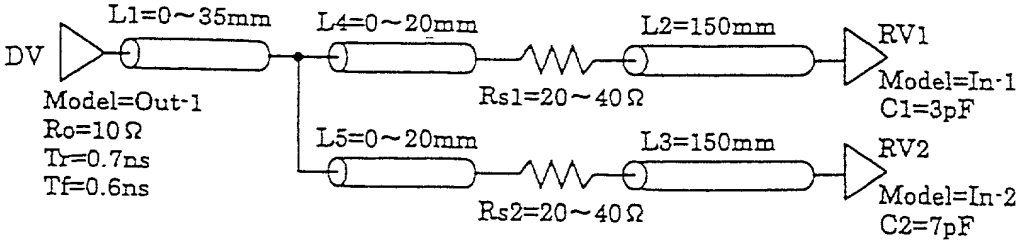

FIG. 20

WIRING TOPOLOGY: STAR TYPE
CHARACTERISTIC IMPEDANCE OF WIRING PATTERN: Z_0=60Ω
TRANSMISSION DELAY TIME OF WIRING PATTERN : T_d=7.0ns/m

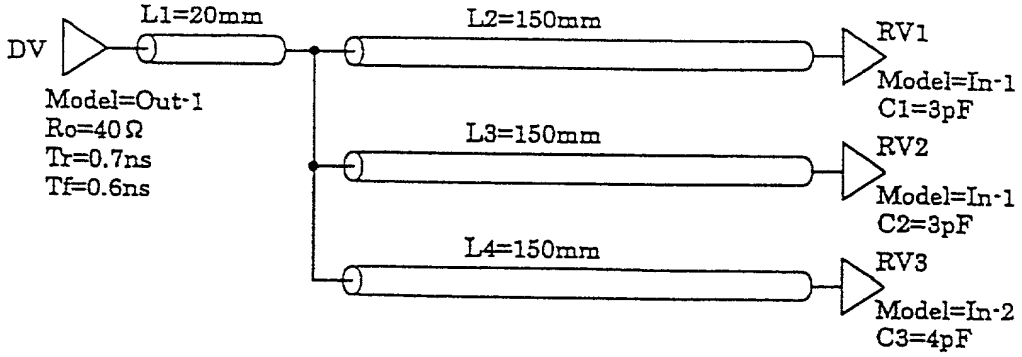

FIG. 21

WIRING TOPOLOGY: LOAD CONCENTRATION TYPE
CHARACTERISTIC IMPEDANCE OF WIRING PATTERN: Z_0=60Ω
TRANSMISSION DELAY TIME OF WIRING PATTERN : T_d=7.0ns/m

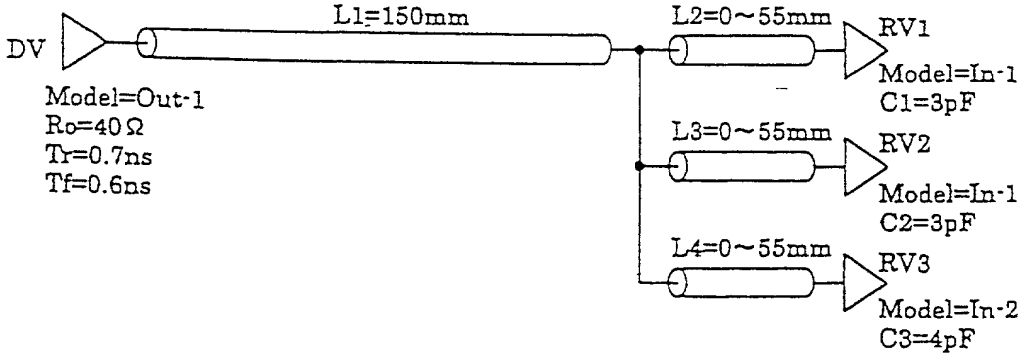

FIG.22

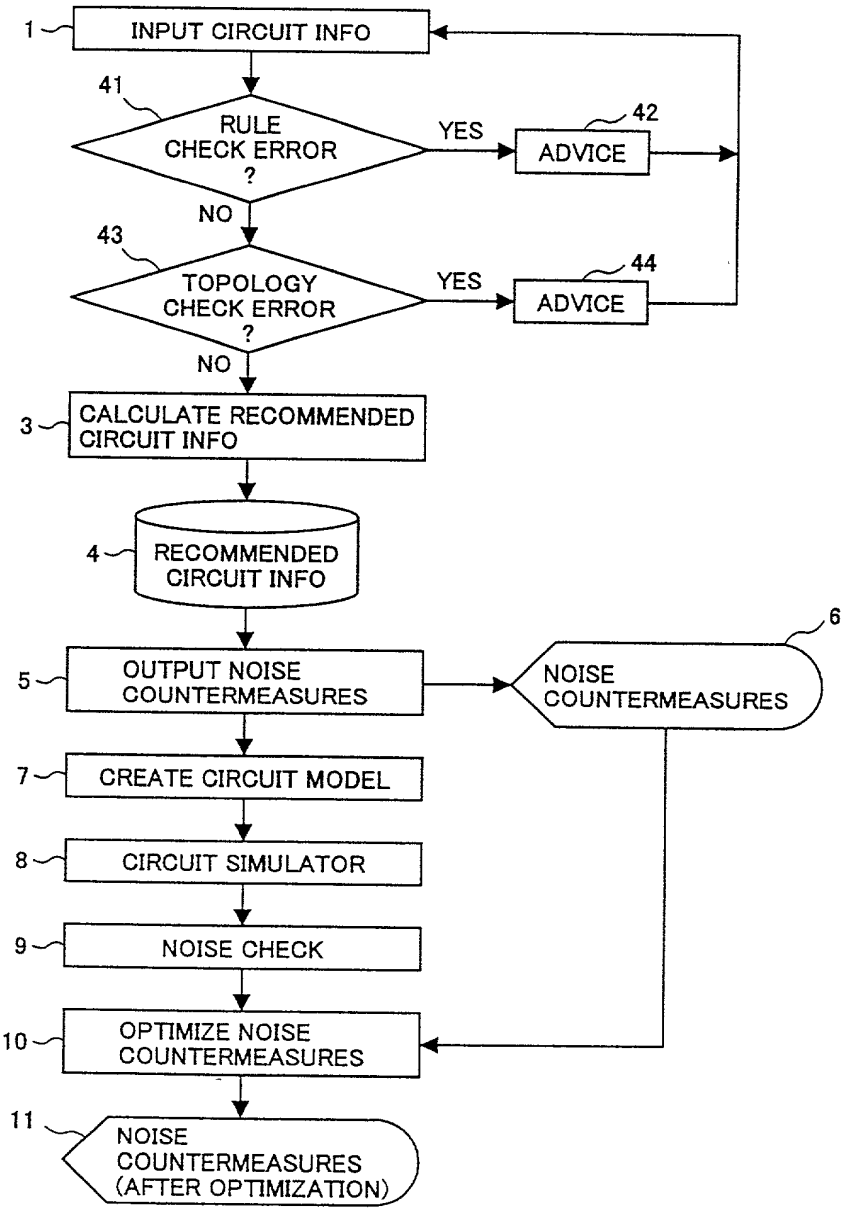
1
INPUT CIRCUIT INFO
41
RULE CHECK ERROR ?
YES
42
ADVICE
NO
43
TOPOLOGY CHECK ERROR ?
YES
44
ADVICE
NO
3
CALCULATE RECOMMENDED CIRCUIT INFO
4
RECOMMENDED CIRCUIT INFO
5
OUTPUT NOISE COUNTERMEASURES
6
NOISE COUNTERMEASURES
7
CREATE CIRCUIT MODEL
8
CIRCUIT SIMULATOR
9
NOISE CHECK
10
OPTIMIZE NOISE COUNTERMEASURES
11
NOISE COUNTERMEASURES (AFTER OPTIMIZATION)

FIG.23

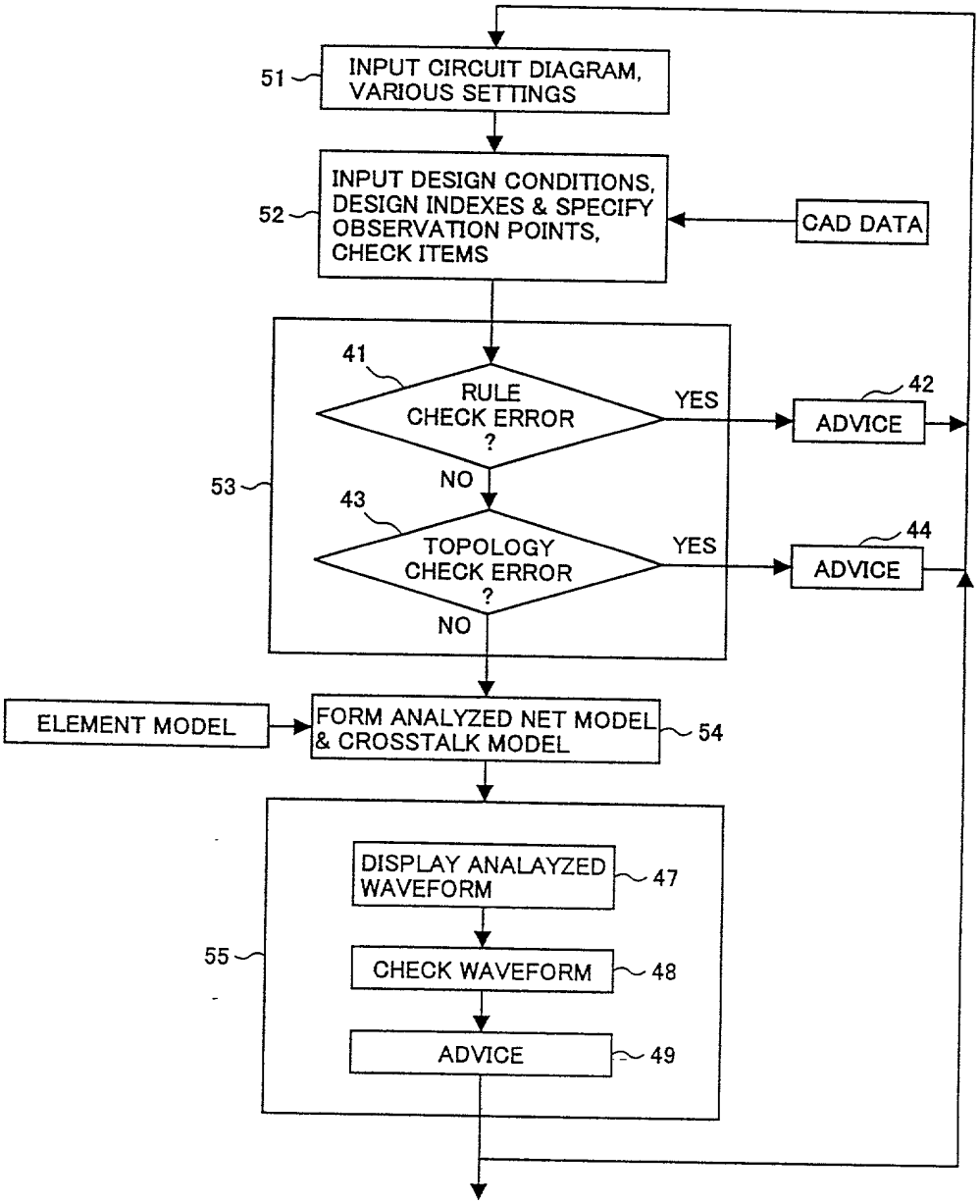
51
INPUT CIRCUIT DIAGRAM, VARIOUS SETTINGS
52
INPUT DESIGN CONDITIONS, DESIGN INDEXES & SPECIFY OBSERVATION POINTS, CHECK ITEMS
CAD DATA
53
41
RULE CHECK ERROR ?
YES
42
ADVICE
NO
43
TOPOLOGY CHECK ERROR ?
YES
44
ADVICE
NO
ELEMENT MODEL
FORM ANALYZED NET MODEL & CROSSTALK MODEL
54
55
DISPLAY ANALAYZED WAVEFORM
47
CHECK WAVEFORM
48
ADVICE
49

FIG. 24

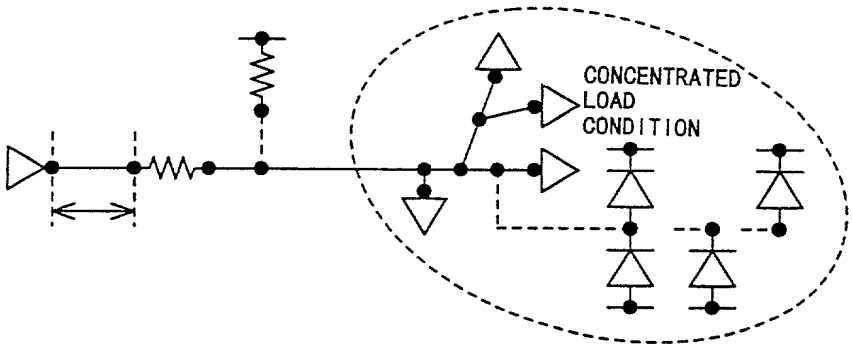

FIG. 25A

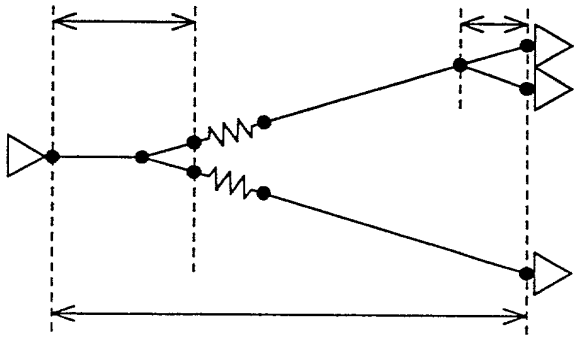

FIG. 25B

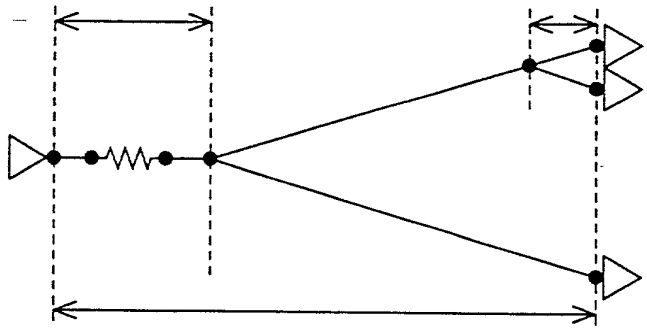

FIG. 26A

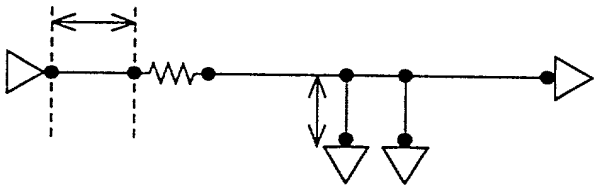

FIG. 26B

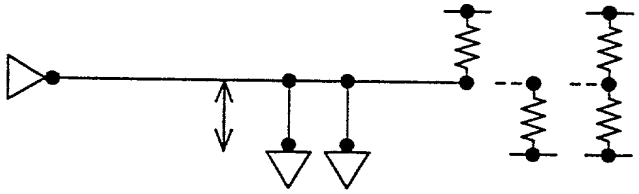

FIG.27

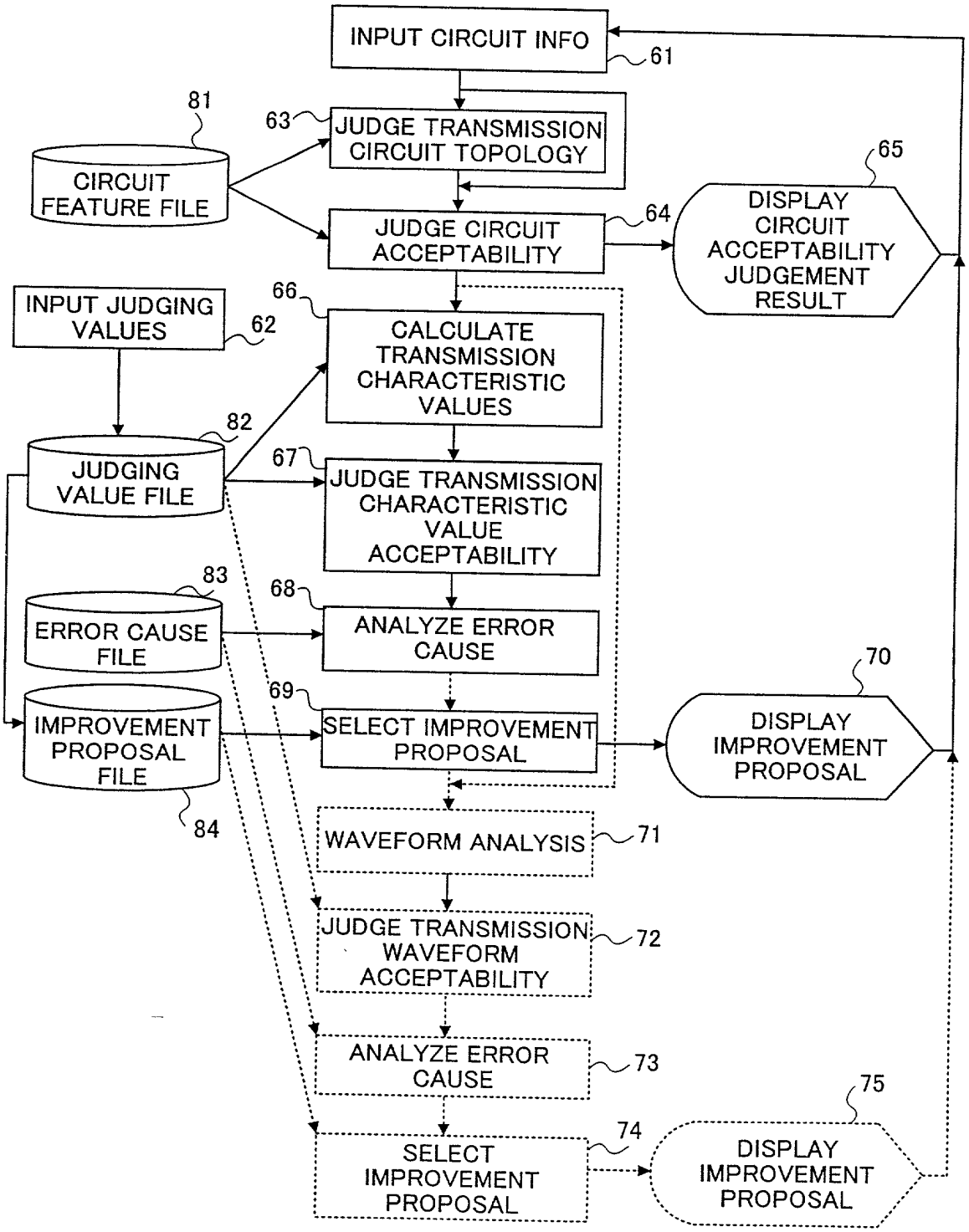
INPUT CIRCUIT INFO
61
81
63
JUDGE TRANSMISSION CIRCUIT TOPOLOGY
CIRCUIT FEATURE FILE
65
DISPLAY CIRCUIT ACCEPTABILITY JUDGEMENT RESULT
64
JUDGE CIRCUIT ACCEPTABILITY
66
INPUT JUDGING VALUES
62
CALCULATE TRANSMISSION CHARACTERISTIC VALUES
82
JUDGING VALUE FILE
67
JUDGE TRANSMISSION CHARACTERISTIC VALUE ACCEPTABILITY
83
68
ERROR CAUSE FILE
ANALYZE ERROR CAUSE
70
69
IMPROVEMENT PROPOSAL FILE
SELECT IMPROVEMENT PROPOSAL
DISPLAY IMPROVEMENT PROPOSAL
84
WAVEFORM ANALYSIS
71
JUDGE TRANSMISSION WAVEFORM ACCEPTABILITY
72
ANALYZE ERROR CAUSE
73
75
74
SELECT IMPROVEMENT PROPOSAL
DISPLAY IMPROVEMENT PROPOSAL

FIG.28

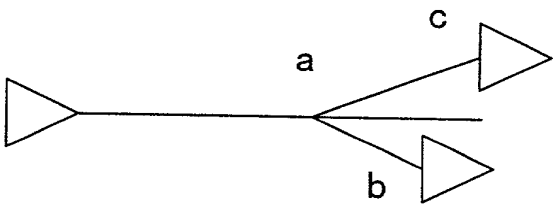

FIG.29

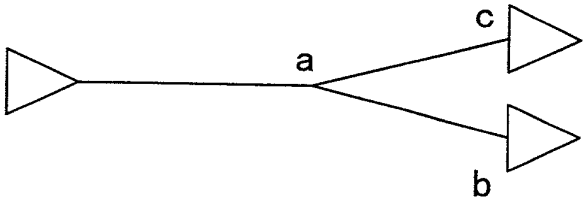

FIG.30

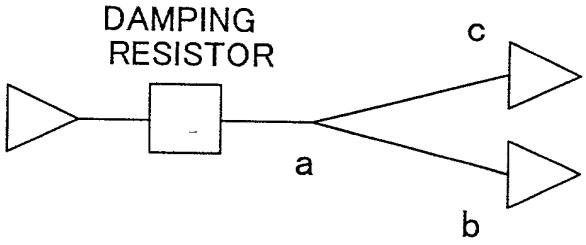

FIG.31

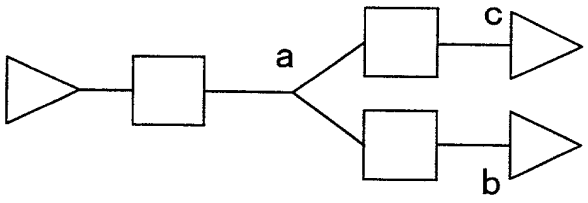

FIG.32

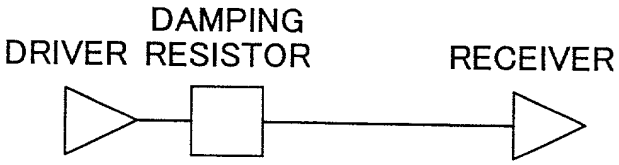

FIG.33

SMALL RECEIVER VOLTAGE	EXCEEDED MAXIMUM RATED VOLTAGE	EXCEEDED DELAY	ERROR CAUSE
×			THE DRIVEN ABILITY OF DRIVER IS SMALL INCLUDING THE DAMPING RESISTOR
	×		THE DRIVEN ABILITY OF DRIVER IS LARGE INCLUDING THE DAMPING RESISTOR
		×	THE WIRING IS LONG
×		×	THE DRIVEN ABILITY OF DRIVER IS SMALL INCLUDING THE DAMPING RESISTOR

FIG.34

ERROR CAUSE	COUNTERMEASURE PROPOSAL	TREE JUDGEMENT
THE DRIVEN ABILITY OF DRIVER IS SMALL INCLUDING THE DAMPING RESISTOR	CHANGE TO DAMPING RESISTOR HAVING SMALL RESISTANCE	SOLUTION FOR RESISTANCE
	CHANGE TO DRIVER HAVING LARGE DRIVEN ABILITY	NO SOLUTION FOR RESISTANCE
THE DRIVEN ABILITY OF DRIVER IS LARGE INCLUDING THE DAMPING RESISTOR	CHANGE TO DAMPING RESISTOR HAVING LARGE RESISTANCE	
	CHANGE TO DRIVER HAVING LARGE DRIVEN ABILITY	DAMPING UNACCEPTABLE
THE WIRING IS LONG	SHORTEN THE WIRING LENGTH	

FIG.35

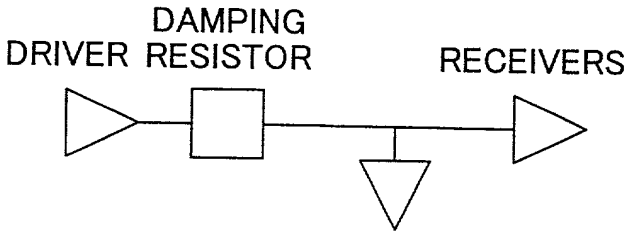

FIG.36

STEPPED PORTION	WAVEFORM DISCONTINUITY	EXCEEDED DELAY	ERROR CAUSE
×			THE DRIVEN ABILITY OF DRIVER IS SMALL INCLUDING DAMPING RESISTOR
	×		THE DRIVEN ABILITY OF DRIVER IS LARGE INCLUDING DAMPING RESISTOR
		×	THE WIRING IS LONG
×		×	A STEPPED PORTION IS GENERATED

FIG.37

ERROR CAUSE	COUNTERMEASURE PROPOSAL	SPECIAL CONDITION
A STEPPED PORTION IS GENERATED	MOVE POSITON OF RECEIVER TOWARDS REMOTE END	RECEIVER POSITION CANNOT BE CHANGED
	PROVIDE TERMINATING RESISTOR AT REMOTE END RECEIVER	POSITION CANNOT BE CHANGED
	REDUCE RESISTANCE OF DAMPING RESISTOR	CANNOT PROVIDE TERMINATING RESISTOR
	CHANGE TO DRIVER HAVING LARGE DRIVEN ABILITY	NO SOLUTION FOR RESITANCE